

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: MSL-1226-00(200) Elbert
P.I. No. 122620
S.R. 72 Widening/Reconstruction

OFFICE: Engineering Services

DATE: January 19, 2007


FROM: Brian K. Summers, PE, Project Review Engineer

TO: Babs Abubakari, PE, State Program Delivery and Consultant Design Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate the VE alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT #	Description	Potential Savings/LCC	Implement	Comments
CONSTRUCTABILITY				
A-1	Use Segmental Box Girder Construction on the new bridge	\$-6,305,100 Cost Increase (Revised)	No	Unit costs have been revised from the VE Study based on current information.
A-2	Use Spliced Bulb Tee Beams on the new bridge	\$2,942,380 (Revised)	Yes	This will be done.
B	Use lesser constant grade on the cross drain pipes with side slope drains down the embankment	\$8,875	Yes	This will be done.
MATERIALS				
A	Adjust the profile grade to minimize the amount of Borrow on this project and consider using waste from MSL-1226-00(300)	\$556,400	Yes	This will be done.

ALT #	Description	Potential Savings/LCC	Implement	Comments
TRAFFIC CONTROL				
A-1	Cul-de-sac closed roads to allow for better emergency vehicle and motorist access	-\$22,455 Cost Increase	Yes	This will be done.
A-2	Eliminate connector road and median opening between Old S.R. 72 and New S.R. 72	\$25,101	No	Results in undesirable sharp alignment.
B	Combine Cherokee Road and CR 19 (Balchin Road)	\$244,685	Yes	This will be done.
C	Use MUTCD standards for Signing and Marking	Design Suggestion	Yes	This will be done.
CONTRACTOR WORK HOURS				
A	Use Restrictive Working Hours of 7:00 am to 9:00 am and 4:00 pm to 6:00 pm and no work allowed on weekends and holidays	Design Suggestion	Yes	This will be done.
CONSTRUCTION TIME				
A	Recommend that the overall contract time be set up as two years	Design Suggestion	No	Construction Office will make the final determination on Contract Time.

A meeting was held on July 24, 2006 to discuss the above recommendations. Joe Leoni and Jim Aitken with Arcadis, Keith Franklin with Florence & Hutcheson, Inc., Omar Zaman and Simeon Robinson with Wilbur Smith Associates, Stanley Hill of

MSL-1226-00(200) Elbert

P.I. No. 122620

Implementation of Value Engineering Study Alternatives

Page 3.

Consultant Design, and Brian Summers and Ron Wishon of Engineering Services were in attendance. Additional information was supplied on January 19, 2007.

The results above reflect the consensus of those in attendance and those who provided input.

Approved:  Date: 1/22/07
David E. Studstill, Jr., P. E., Chief Engineer

BKS/REW

Attachments

c: Gus Shanine, FHWA
Sandy Moore
Todd Wood
Randy Hart
Alexis John
Doug Franks
Otis Clark
Lisa Myers

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA



INTERDEPARTMENT CORRESPONDENCE

FILE MSL-1226-00 (200), Elbert County
P.I. No. 122620

OFFICE Consultant Design
DATE June 27, 2006

Widening and reconstruction of SR 72 beginning at CR 245/Pearl Mill Road to and ending east of the Savannah River Bridge in South Carolina

M. Babs Abubakari

FROM Mohammed (Babs) Abubakari, P.E.
State Program Delivery and Consultant Design Engineer

TO Brian Summers, P.E. State Project Review Engineer
Attn: Lisa Myers

SUBJECT REPONSES TO VALUE ENGINEERING STUDY (March 23, 2006)

Please refer to the enclosed attachments for the responses to Value Engineering Study conducted on the above project. Also, please notice in the attached responses that the GDOT Bridge Office has already received a copy of the responses as pertaining to the bridge design.

This project is located in Elbert County and consists of the widening of SR 72 from CR 245/Pearl Mill Road to approximately 0.57 miles east of the Savannah River Bridge in South Carolina. This project includes a new two-lane bridge parallel to the existing Savannah River Bridge for the westbound traffic. The project total length is 7.40 miles.

The above project is being designed by the consultant firm of Wilbur Smith Associates as a sub to ARCADIS. This project is in the preliminary design phase and is waiting for environmental approval before requesting a PFPR. The construction (CST) phase of this project is currently in LR.

Please contact Otis Clark at (404) 463-7486 or Steve Callis, with ARCADIS, at 770-431-8666 for any additional information or clarification you may need.

MBA:SH:OC

Value Engineering Constructability Study Response

**WIDENING AND RECONSTRUCTION OF
SR 72 FROM CR 245 / PEARL MILL ROAD TO
THE SAVANAH RIVER BRIDGE IN SOUTH CAROLINA**

PROJECT NUMBER: MSL-1226-00(200)

ATLANTA, GEORGIA

April 25, 2006

EVALUATION PHASE

IV. CONTRACTOR WORK HOURS

A. CLOSURES

⇒ No closures from 7am - 9am and 4pm – 6pm Saturdays and Sundays.

⇒ Concur ... will include in the Traffic Control 150 Special Provision.

V. CONSTRUCTION TIME

A. LENGTH OF TIME

⇒ Use 24 months for overall project.

⇒ We recommend a longer “Construction Time” for this project. Considering the new bridge construction (2100 ft long) and the length of roadway we recommend 30 to 36 months for the overall project Construction Time. However, we defer this estimate of time to the GDOT Bridge and Roadway construction personnel.

DEVELOPMENT PHASE

I. CONSTRUCTABILITY

B. STORM DRAIN PIPE

⇒ The Value Engineering Alternative to the proposed cross drain is to use lesser grade on the cross drain under the roadway proper and then use a slope drain pipe down the embankment slope. In the location focused on as the study example the inlet box was eliminated due to the flatter grade, which has now become approximately 7%, eliminating the requirement for metal pipe under the roadway. The height of the median drop inlet is significantly decreased making it much more maintainable.

There is a concrete collar poured around the intersection of the cross drain and the slope drain. The study team recommends that there also be included a couple of tie-down straps back into the embankment to reduce the possibility of separation. On this example, a cost savings of almost \$9,000 would be realized. Over the length of the project, if this type design was used, the savings could become significant.

⇒ Concur ... will modify the cross-drain pipe portion to be concrete storm drain pipe under the roadway at less than 10% grade and corrugated metal slope drain pipe to be used down the roadway

slope. However, we recommend that a manhole be used in lieu of the concrete collar to joint the two pipes.

II. MATERIALS

A EARTHWORK

- ⇒ The most pressing problem with the earthwork on this project is the fact that there is an estimated 600,000 cubic yards of borrow. This is a tremendous amount of material that will have to be located and hauled in by the contractor. More than likely, the contractor may have to acquire a site or sites to obtain this material. The material will have to be trucked from the borrow areas. Again, as previously stated, this will also influence a high cost for the earthwork item.

The Value Engineering Alternative is to lower the grade throughout the project starting east of CR 45 to near the Richard B. Russell Lake. This should not affect driveway connections or grade crossings significantly. Since this should have off-setting right-of-way costs, right-of-way was not considered, i.e. lowering the grade would increase right-of-way in the cuts as the slope distance is increased, and decrease the right-of-way in the fills as the slope distance is decreased. Lowering the grade 1.5 ft. will reduce the borrow item by approximately 200,000 CY, and result in a need for approximately 400,000 cubic yards for this project.

The recommendation of the study team is that the design be modified to significantly reduce this huge amount of borrow material. As an added concept, project MSL-1226 (300) located immediately to the east of the study project is going to produce an estimated 350,000 cubic yards of waste. There needs to be some consideration to somehow use the waste material from one project as borrow for the adjacent project.

- ⇒ Concur with studying this recommendation. We will review the roadway profile design and consider modification to the profile (if the grade change does not adversely affect side roads and drainage) by supplemental agreement to reduce the quantity of borrow required. We concur that the waste on adjacent project MSL-1226 (300) be utilized on this project to minimize any grade change to balance the earthwork.

III. TRAFFIC CONTROL

B. EXISTING PAVEMENT

- ⇒ The Value Engineering Team recommends using a cul-de-sac at the end of the abandoned part of CR 17/ Welcome Church Road to replace the barricade. The cul-de-sac will provide emergency vehicles and motorists a better turn around location.
- ⇒ Concur with installing a cul-de-sac at the end of any closed roads for traffic to turn around.
- ⇒ Old SR 72 between STA 165+00 and STA 205+00 has the ability to connect to the new alignment of SR 72 at the intersections of CR 26 / Longstreet Road and at SR 79 where SR 72 already have median openings designed.
- ⇒ Concur ... will implement recommendation.
- ⇒ Eliminated connector road and median opening between Old SR 72 and new SR 72 at STA 195+80.
- ⇒ Concur ... will implement recommendation.
- ⇒ Connect Old SR 72 to new SR 72 alignment at STA 211+00 where there is a median opening design.
- ⇒ Concur ... will implement recommendation.
- ⇒ The VE Team recommends intersecting CR 21 / Cherokee Road with CR 19 / Balchin Road. This alignment will reduce the amount of reconstruction of CR 21 and the required right-of-way.
- ⇒ Concur ... will implement recommendation.

IV. TRAFFIC CONTROL

C. SIGNING AND MARKING

- ⇒ The placement of advance warning signs is very important consideration for the safe operation of roadway. The MUTCD requires that warning signs be placed at such a location to allow the motorist to perceive and react to the information. This is called the PIEV time and is described in Section 2C.05 of the MUCD. The proposed plans include the placement of intersection signs

with accompanying road name signs in advance of the intersections. These signs are generally placed between 600' and 700' from the intersection. Left turn lanes for divided highways begin some 900' to 1000' from the intersection due to the use of Type B median crossovers. Since the motorist needs time to perceive and react to the need to change lanes, reduce speed and enter the turn lane, the intersection warning signs should be installed 300' to 500' before the beginning of the left turn lane.

⇒ Concur ... we will review all the median crossovers for sign locations and will revise accordingly.

DEVELOPMENT PHASE

VI. CONTRACTOR WORK HOURS

A. CLOSURES

⇒ The study team recommends that restricted work hours be included in this project to limit the times that the contractor can interfere with traffic or have lane closures. These restrictions include no lane closures in the AM peak between 7:00 and 9:00 and also no lane closures in the PM peak between 4:00 and 6:00. There should also be a requirement that there be no work on Saturday, Sunday or holidays.

⇒ Recommend that the appropriate GDOT District and General Office Construction personnel review the above VE comment for restrictive hours and days and their recommendation will be included in the Traffic Control 150 Special Provision.



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MEMO

To:
Paul V. Liles, PE
State Bridge Engineer
Georgia Department of Transportation
No. 2 Capitol Square, Room 258
Atlanta, GA 30334

Copies:
S.Callis
J.Leoni
S.Wynn
J. Tiernan

From:
Jim Aitken

Date:
16 May 2006

ARCADIS Project No.:
GA063160.2004.00002

Subject:
MSL-1226-00(200) SR-72 over Richard B. Russell Lake, Elbert County, Value
Engineering (VE) Study Recommendations, ARCADIS Responses

ARCADIS has been asked to provide comments on the VE study dated March 23, 2006 for the named project. Until we received these comments we were proceeding with preparing the preliminary bridge layout plans. We have stopped work on the preliminary layout until Georgia DOT provides us with direction on how to proceed. Our comments on the VE study recommendations follow.

The existing bridge over Richard B. Russell Lake has a steel superstructure which was the basis of selecting the proposed bridge type. Traditionally in Georgia the most economical material for a maximum span of 236 feet is steel. The original approved concept was to construct a steel bridge with a span configuration that matched the existing bridge.

The study recommends two superstructure alternates other than the approved concept (steel plate girders). Alternate 1 is a Concrete Segmental Box Girder bridge and Alternative 2 is a Spliced PSC Bulb-Tee Bridge. The alternates utilize a single large diameter (10' +) drilled shaft as the substructure at the same locations as the existing piers. According to the study the estimated cost and potential cost savings for each alternate, including the proposed steel bridge are:

ARCADIS

Alternate	Construction Cost (From VE study March 23, 2006)	SF Cost (84,064 sf)	Savings compared to Proposed Bridge
Proposed: Steel	\$27,195,998	\$250 \$150	-
Alternate 1: Segmental Concrete Box	\$17,789,886	\$211 \$225	\$9,406,112 - \$6,305,100 (COST INCREASE)
Alternate 2: Spliced PSC Bulb-Tee Beams	\$15,614,206	\$185 \$115	\$11,581,792 \$2,942,380

REVISED 11/19/07 PER ENG. SERVICES ESTIMATORS

Alternates 1 & 2 are viable and have been used effectively on similar type projects in the southeastern states, particularly in Florida.

The VE study recommends superstructure types that are not typically constructed in Georgia. Our primary concern is that the study presents the steel alternate as an inefficient solution to crossing the lake, but there are no references to the sources used for the cost estimates. The Georgia DOT typically uses \$80/SF for steel bridges. Since this is not a typical steel bridge there will obviously be an escalation, but the VE study uses \$250/ SF which is more than a 300% increase. Due to the rising cost of fuel, materials and labor, \$250/ SF may be valid for this type of construction, but there is no data provided in the study to support this cost or the comparative alternative costs.

Does the VE study consider the following in determining the cost estimates for each alternative?

- Project location & transport of concrete beams or box girder segments to the site. The site is in a location where the materials would need to be delivered by truck from either Georgia or South Carolina. If the pre-cast concrete elements will be constructed at a temporary pre-casting facility close to the site has the cost of setting up the yard been considered? Will a temporary facility cause any environmental concerns?
- Local experience. There is limited experience in Georgia and South Carolina with the proposed alternates. Contractors that have expertise in constructing of the two superstructure types would be limited and would most likely not be local to Georgia. Would enough experienced contractors bid on the project to make the process competitive and give the State the best value?
- Improving the existing concept. The study focuses on changing the concept entirely by focusing only on the pre-cast post-tensioned alternatives. It does not consider improving the existing concept. Prior to the VE study ARCADIS was considering increasing the beam spacing to use fewer steel plate girders in the section. This would result in one less line of beams and have a thus reducing the cost of the bridge.

ARCADIS

We are requesting guidance from the Department on the structure type that will be used at this location. Please contact Jim Aitken to discuss.